

"APPROVED FOR RELEASE: 03/14/2001

CIA-RDP86-00513R001860230005-6

VIASOV, A. D.

APPROVED FOR RELEASE: 03/14/2001

CIA-RDP86-00513R001860230005-6"

VLASOV, N. D.

N. B. Голубиц,
A. С. ТагирО механизме работы генератора звуковой
СВЧ, в котором используется метод синхронных ме-
ханизмовB. O. Соловьев
О предельных параметрах нового электронных
приборов плазменного диапазона.9 часов
(с 18 до 22 часов)

A. B. Власов

О методе генерации звука в тоне электронных
лучей.

Г. А. Зейтлин

О синхронизацию электронного пучка с электри-
ческим полем

M. B. Голубиц

Метод расчета параметров электромагнитных СВЧ
генераторов погружного типа

A. N. Денисов,

Ю. Н. Романов

Об определении коэффициента управления для по-
стоянных распространяющихся в замкнутой системе про-
цессов электронных пучков

30

A. B. Голубиц

Взаимодействие электронных пучков с звукоп-
оглощающими электронными волнами

... 10 часов

(с 10 до 16 часов)

A. N. Тагиринов,

B. A. Коробкин

О возможности улучшения параметров резонатор-
ной системы методом определения эволюции форм
из резонаторов.

M. N. Кузнецов,

A. B. Родинов

К вопросу о механизме флюктуаций в магнитных

M. N. Кузнецов,

M. N. Борисов,

B. B. Власов

Экспериментальные исследования флюктуаций в магнитных

M. M. Борисов,

B. M. Матвеев,

B. B. Власов

Малогабаритный генератор для решения задач
подавления переключения частот в интеграторах с
изменяющимися полем

33

report submitted for the Centennial Meeting of the Scientific Technological Society of
Radio Engineering and Electrical Communications M. A. B. Popov (VEBTS), Moscow,
6-10 June 1959

PHASE 1 ROCK DATE: 10W SOV/3556

Moscow. Inzhenerno-fizicheskiy Institut

Nekotorye voprosy eksperimental'noy fiziki; [sbornik] vyp. 2.
(Some Problems in Experimental Physics; Collection of Articles.
N. 2.) Moscow, Atomizdat, 1959. 123 p. 3,200 copies printed.Sponsoring Agency: RSFSR. Ministerstvo obrazovaniya.
sponsoring agency obrazovaniya.Ed.: B.M. Stepanov, Doctor of Physical and Mathematical Sciences,
Professor; Tech. Ed.: S.M. Popova.PURPOSE: This collection of articles is intended for graduate
engineers and physicists engaged in the design of physical
(laboratory) apparatus, and automatic and telemechanic equipment.COVERAGE: This collection of articles on experimental physics was
written by members of the Moscow Physics and Engineering Institute.
Each article is accompanied by drawings and references.Dolgorukin, B.A., B.L. Polikarov, and V.I. Ushakov. Operation of
Gas-Dissociation-Reactors During Over-Exciting Pulses 32The authors deal with the results of a study of the operation
of the MG-9, GS-9 and GS-10 standard counters under controlled
pulse feed operating conditions. The dependence of ionization
rate on pulse feed conditions is analyzed. A sample
method of measuring discharge propagation speed along the coun-
ter electrode is described.Vorobjeva, M.A. Compensating the Effect of Intersections
in a Linear Proton Accelerator 40
The problem of compensating the unfavorable effect of inter-
sections of particles in a linear
proton accelerator is discussed.Izotov, I.M. Calculating the Profiles of Magnetic Poles 50
The article describes a method of computing profiles of the
poles of permanent magnets of charged-particle accelerators for a given
field distribution in the plane of symmetry (the fringe effect
is not taken into account).Malyshev, A.P. Some Special Optical Properties of Static Artificial
Systems 54
The author gives a brief review of the literature on the optical
properties of various systems, mainly dielectric, birefringent and elec-
tric and magnetic media with unequal dimensions and
of arbitrary shape.Vorobjeva, M.A. Sensitivity of the Glowing-Discharge Method 69
Kirillov University, V.G., P.A. Didenko, A.M. Kudryavtsev, L.P.
Kostyleva. Statistical Method with a Pulse of About 100 nsec
in Counter and Ion 69
Dolgorukin, B.A. and V.I. Uschakov. Polarization of Protons
at Sea Level 70Petrovich, V.I. Some Trends in Turbulent Turbine Flow 76
In British U.S. Inter-University Conference on Turbulence, Central Institute of
Applied Mathematics, Moscow, 1958. The article gives a brief review of the
present state of the theory of turbulent flow in pipes and
turbines. The author also discusses the problem of the
possibility of using the theory of turbulent flow in
turbines to calculate the flow in the blades of
turbines.Vorobjeva, M.A. Some Problems in the Application of the
Glowing-Discharge Method to the Study of
Radioactive Specimens 78

AUTHOR: Vlasov, A.D.

SOV/109-59-4-2-18/27

TITLE: Longitudinal Motion of Electrons and the Tolerances in
a Linear Accelerator (Prodol'noye dvizheniye
elektronov i dopuski v lineynom uskoritele)PERIODICAL: Radiotekhnika i Elektronika, 1959, Vol 4, Nr 2,
pp 295-302 (USSR)ABSTRACT: The accelerator considered operates with travelling
waves at a wavelength of 10 cm. The device is divided
into sections and consists of a cylindrical disc-loaded
waveguide. First the energy spectrum and the injection
conditions are considered. The longitudinal motion of
a particle carrying a charge e and having a velocity
 $v = \beta c$ (where c is the velocity of light) in the field
of the travelling wave, having an amplitude E and a
phase velocity $v_\phi = \beta_0 c$, is described by:

$$d\varepsilon = eE \cos \phi \, dz,$$

$$\frac{d\phi}{dz} = \frac{2\pi}{\lambda} \left(\frac{1}{\beta_0} - \frac{1}{\beta} \right) = \frac{2\pi}{\lambda} \left(\frac{1}{\beta_0} - \frac{e}{\sqrt{e^2 - \varepsilon_0^2}} \right) \quad (1)$$

Card 1/4

SOV/109-59-4-2-18/27

Longitudinal Motion of Electrons and the Tolerances in a Linear Accelerator

where ϵ is the energy of the particle, ϵ_0 is the rest energy of the particle, λ is the wavelength, z is the longitudinal co-ordinate and ϕ is the phase of the particle. By integrating Eq (1), an expression in the form of Eq (2) is obtained, where Φ is a constant depending on the initial conditions. When the phase velocity of the travelling wave is equal to the velocity of light, Eq (2) can be written as Eq (3). This is used to plot the phase trajectories of the particles for $A = 0.625$, $\beta_0 = 1$, $\beta_0 = 1 + 5 \times 10^{-5}$ and for various values of Φ . The injection conditions for the system can be expressed by Eq (6) where the values of E_H , A_H and ϵ_H refer to the conditions at the input of a section of the waveguide. The dependence of the output energy on the injection conditions can be found by determining the second integral of Eq (1). When $\beta_0 = 1$, the output energy is expressed by Eq (7), where E denotes the average value of the electric field. The energy spectrum at the output can be expressed by Eq (8), where the summation is taken over all the values of the function ϕ_H .

Card 2/4

SOV/109-59-4-2-18/27

Longitudinal Motion of Electrons and the Tolerances in a Linear Accelerator

The dependence of the spectral density on the output energy is illustrated in Fig 2. From the above formulae it is concluded that by means of the accelerator it is possible to obtain comparatively narrow spectra. It is shown that at the wavelength of 10 cm and $A_H = 0.625$, the spread of the output energies does not exceed 1% for more than two-thirds of the total number of the injected particles. However, the errors in the dimensions and the operating parameters of the accelerator lead to a reduction in the energy of the accelerated particles. It is, therefore, of interest to determine the reduction in the output energy due to the changes of the phase velocity of the accelerating wave, temperature and the dimensions of the waveguide. In analysing this problem it is assumed that the phase velocity can be written as $v_{\phi} = (\beta_0 + \beta_{\infty})c$. The phase velocities of the higher harmonics of the accelerating field can be expressed approximately as $v_{\phi n} = nc$. The changes of the amplitude of the accelerating field can be expressed by a

Card 3/4

SOV/109-59-4-2-18/27

Longitudinal Motion of Electrons and the Tolerances in a Linear Accelerator

coefficient $(1 + \rho_\infty)$. Consequently, Eq (1) are written as Eq (10) and (11). Partial solutions of these equations are found and it is shown that these can be employed to determine the tolerances of the accelerator for the prescribed values of the phase velocity error and the reduction of the output energy. The application of these formulae is illustrated by a numerical example. The author expresses his gratitude to E.L.Burshteyn for his valuable remarks. There are 2 figures and 8 references of which 3 are Soviet and 5 English.

SUBMITTED: 16th May 1957

Card 4/4

66361

SOV/120-59-5-4/46

2/1.21/00

AUTHORS: Burshteyn, E. L. and Vlasov, A.D.

TITLE: Design of a Klystron Buncher for an Electron Linear Accelerator

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 5,
pp 26-28 (USSR)

ABSTRACT: It is well known that the energy resolution of electrons accelerated by a linear accelerator can be improved by using preliminary wave-guide or klystron bunchers. The present paper is concerned with the choice of the optimum characteristics of klystron bunchers. Consider an electron which leaves the injector with a kinetic energy W_i and enters the gap of the buncher with a phase θ . After passing through the gap the energy of the electron will be $W = W_i(1 - m \sin \theta)$, where U is the amplitude of the voltage applied to the gap, $m = eU/W_i$ is the energy modulation coefficient and the phase φ of the electron relative to the accelerating wave at the input of the accelerator is given by $\varphi = \theta - A \sin \theta$. It follows that the relation between the energy W_H and the phase φ_H at the input into the

Card1/3

4

66361

SOV/120-59-5-4/46

Design of a Klystron Buncher for an Electron Linear Accelerator

accelerator is given by Eq (1) and this is shown by curve 1 in Fig 1. The quantity A is the so-called bunching parameter and is given by Eq (2), where ℓ is the distance from the buncher gap to the input of the accelerator, W_0 is the electron rest energy and λ is the wavelength. In the case of a linear accelerator with a constant phase velocity c and a constant amplitude E_m of the accelerating field, the electron energy W and phase φ is given by Eq (3), where $\alpha = eE_m \lambda/W_0$ and θ are the limiting values of the phase φ . Eq (3) is only approximate but may be used by assuming that E_m is the field amplitude at the input to the accelerator. Curves 2 in Fig 1 represent lower parts of the phase trajectories for different initial values of φ_H and W_H . It is assumed that the accelerator is sufficiently long so that the relative spread in the output energies is determined by the spread in the values of φ . The relative spread of output energies does not exceed q ($q \ll 1$) for those particles for which $1-q \leq |\sin \varphi| \leq 1$.

Card2/3

66361

SOV/120-59-5-4/46

Design of a Klystron Buncher for an Electron Linear Accelerator
i.e. for those points on curve 1 in Fig 1 which lie
between the phase trajectories 2a and 2b which
correspond to $\cos \Phi \approx \pm \sqrt{2q}$. The problem is then
reduced to the determination of the buncher parameters
and the value of the injection energy for which a
maximum number of particles is found between these two
limiting phase trajectories. Formulae are derived
which may be used to achieve this.
There are 1 figure and 2 references, 1 of which is
Soviet and 1 English.

4

SUBMITTED: August 4, 1958

Card 3/3

9.1300

77773
SOV/100-5-2-11/26

AUTHOR:

Vlasov, A. D.

TITLE:

On Brillouin's Electron Flows and Boundary Particle
Conception

PERIODICAL:

Radiotekhnika i elektronika, 1960, Vol 5, Nr 2,
pp 264-268 (USSR)

ABSTRACT:

The stability of electron beams, calculated on the assumption of the presence of boundary particles and laminar movement of electrons is analyzed. It is shown that this widely accepted approach does not always give correct answers, and in many cases leads to beams of unstable structure. The analysis of electron beams with a considerable space charge, and focused by longitudinal magnetic field, is usually based on the assumption of the presence of boundary particles, and the equation of motion of the electron located on the outer surface of the beam is solved. The trajectories of the inner electrons are assumed to follow the outer electron

Card 1/9

On Brillouin's Electron Flows and Boundary
Particle Conception

77775
SOV/100-5-2-11/26

trajectory (laminar flow). The concept of the boundary particle is the basis of the known flows of Brillouin (see U.S. reference at end of abstract), and is widely accepted by scientists. While most of the investigations are concerned with the equilibrium conditions in the electron flow, it is necessary also to insure the stability of the equilibrated beam structure. A cylindrical coordinate system r , θ , z , the z -axis coinciding with the axis of the symmetrical beam is used. A longitudinal magnetic field B_z , axially symmetrical, focuses the beam. The radius changes along the z -axis are slow. Under these conditions the radial movement of the electron in the beam is described by Eq. (1).

Card 2/9

$$\frac{d}{dt}(mr) + \frac{e^2 B_z^2}{4m} r^2 + p_r + \frac{e^2}{4m} \left(B_z + \frac{2m}{e} \dot{\theta} \right)_0^2 \frac{r_0^4}{r^2} = 0. \quad (1)$$

On Brillouin's Electron Flows and Boundary
Particle Conception

77778
SOV/109-5-2-11-26

Here $m = m_0 / \sqrt{1 - \beta^2}$; m_0 - rest mass of the electron;
e - electron charge; $\beta = v/c$ - ratio of electron
velocity to light velocity; t - time; P_r - radial
force due to the space charge of the electron beam;
index "0" denotes initial conditions of the variables.
 $I(r, r_0)$ - current through section with radius r.
The charge of the beam induces an electric and a mag-
netic field with components

$$E_r = -\frac{I(r, r_0)}{2\pi\epsilon_0 v_0 r}, \quad B_\theta = -\frac{I(r, r_0)}{2\pi\epsilon_0 c^2 r}.$$

Therefore

$$P_r = -e(E_r - v_\theta B_\theta) = \frac{e(1 - \beta^2)}{2\pi\epsilon_0 v_0} \frac{I(r, r_0)}{r}.$$

Card 3/9

On Brillouin's Electron Flows and Boundary
Particle Conception

77778
SOV/109-5-2-11/26

This expression is substituted into (1), the variable
 $\rho = r \sqrt{\frac{m}{m_0}}$ is introduced and the slow change of m is
taken into consideration for transforming (1) into

$$\frac{d^2\rho}{dt^2} + A\rho = \frac{BI(p, p_r)}{\rho} + \frac{C\rho_0^4}{\rho^3}, \quad (2)$$

where

$$A = \frac{e^2 B_z^2}{4m^3}, \quad B = \frac{e(1 - \beta_z^2)}{2\pi c m_0 v_z}, \quad C = \left(\frac{eB_z}{2m} - \dot{\psi} \right)_0^2. \quad (3)$$

If electrons are present which are on the outside of
the beam the whole time ($\rho = \rho_r$) the movement of
each is described by the equation

$$\frac{d^2\rho_r}{dt^2} + A\rho_r = \frac{BI}{\rho_r} + \frac{C\rho_{r0}^4}{\rho_r^3}. \quad (4)$$

Here $I = I(\rho_r, \rho_{r0})$ - full current of the beam.
The current density through the section of the beam,

Card 4/9

On Brillouin's Electron Flows and Boundary
Particle Conception

77778
SOV/109-5-2-11/26

the longitudinal velocity v_z and coefficients A, B, C are assumed to be equal for all particles. As shown by (3) $BI > 0$, $C \geq 0$. Equation (4) proves that a radially limited beam is possible only for $A > 0$, for which condition, as proved by C. C. Wang (U.S. reference), the solution of the boundary particle equation is a periodic positive function with a period T

$$\rho_r = \rho_r(t) = \rho_r(t + T), \quad (5)$$

fluctuating around the equilibrated value of radius ρ_1 , which is determined by the biquadratic equation

$$A\rho_1^4 = BI\rho_1^2 + C\rho_1^4. \quad (6)$$

Equation (6) is derived from (4) for $\int \Gamma = \text{const.}$ Since certain deviations from the assumed conditions are inevitable, it is necessary to consider the general solution of Eq. (2), depending on two arbitrary constants. For stability of the beam structure it is required that the small deviations of the initial

Card 5/9

On Brillouin's Electron Flow and Boundary
Particle Conception

77778
SOV/109-5-2-11/26

conditions lead only to limited deviations of the particle trajectories from the assumed. The case when $C = 0$ is investigated, which takes place, e.g., when $B_{z0} = 0$ and $\mathcal{J}_0 = 0$, the cathode is shielded from the focusing magnetic field, and the electrons leave the cathode with zero azimuthal velocities. Equation (2) becomes linear

$$\frac{dp_r}{dt} + \left(A - \frac{BI}{\rho_1^2} \right) p_r = 0, \quad (7)$$

but the needed focusing field (for given BI, ρ_1) - minimum; $B_z = B_{z \text{ min}} = 2m \sqrt{BI/e\rho_1}$ (see (6) and (3)). The general solution of (7) is

$$p(t) = C_{\text{par}} + C_{\text{par}} e^{\int A dt}, \quad (8)$$

where $\rho_{\text{II}} = f_{\text{II}}(t)$ - second particular solution of (7), linearly independent of ρ_{I} (5). Nominally the trajectories of inner particles are considered as being similar to the trajectory of the outer particle (5),

Card 6/9

On Brillouin's Electron Flows and Boundary
Particle Conception

77778
SOV/109-5-2-11/26

i.e., it is $C_2 = 0$ and $0 \leq C_1 \leq 1$, and the initial
conditions for each particle should satisfy the
proportion

$$\frac{p_0}{p_0} = \frac{p_{p_0}}{p_{p_0}} \quad (9)$$

Equation (7) has a periodic and positive partial solution ρ_I per (5), but the second partial solution ρ_{II} increases without limit with time in the form $t^\alpha \varphi(t)$, where φ is a periodic function with period T . Therefore, the electron beam as calculated on the basis of boundary particle conditions is not stable and disintegrates at very small deviations from (9), because divergent trajectories (8) appear. This applies also to Brillouin's flow, which is unstable. Another assumed condition is $C = 0$, for which the inner trajectories equation is

$$\frac{d^2p}{dt^2} + \left(A - \frac{BI}{p_r^2} \right) p = \frac{C_{p_0}^4}{p^3} \quad (10)$$

Card 7/9

On Brillouin's Electron Flows and Boundary
Particle Conception

77778
SOV/109-5-2-11/26

Inner trajectories, similar to the boundary particle
trajectory (5), satisfy this equation

$$\rho(t) = \frac{p_0}{p_{t0}} \rho_r(t). \quad (11)$$

Contrary to the above mentioned case of $C = 0$ the
structure is stable with relation to the deviations
from the initial conditions. The general solution
of (10) is

$$\rho = \sqrt{p_1^2 + C_{12}^2} e^{\pm i \omega t}, \quad (12)$$

where $\rho_{I,II}(t)$ - two linear independent solutions of
(7). One of solutions (12) can be periodic when
solutions $\rho_{I,II}$ of (7) are within the stability limits.
Analysis of the divergent beam for $C = 0$ and $A \leq 0$
confirms the stability structure assuming presence of
boundary particles. Solution of the boundary equation
(4) is aperiodic and first diminishes for $\rho_{r0} < 0$,
and after reaching the minimum increases without limit.

Card 8/9

On Brillouin's Electron Flows and Boundary
Particle Conception

77778
SOV/109-5-2-11/26

There is no contraction of beam for $\rho_{ro} \geq 0$. Under certain conditions the disintegrated beam is transformed into a stable beam of different structure, but if the length of the focus structure is adequate, but this case is not the object of the present paper. It is only noted that the focusing field must in this case exceed $B_z \text{ min}$ by a certain margin. The conclusion is drawn that the assumption of the presence of boundary particles and laminar movement of electrons in the beam does not always lead to correct results. Generally speaking, in a stable electron beam the outside particles do not follow the outside surface of the beam, which can only be considered as the envelope. There are 12 references, 5 Soviet, 6 U.S., 1 German. The U.S. references are: L. Brillouin, Phys. Rev., 1945, 67, 260; C. C. Wang, Proc. IRE., 1955, 38, 135; J. T. Mendel, Proc. IRE., 1955, 43, 3, 327; J. T. Mendel, C. F. Quate, W. H. Vocom, Proc. IRE., 1954, 42, 5, 800; A. M. Clogston, H. Heffner, J. Appl. Phys., 1954, 25, 436; P. K. Tien, J. Appl. Phys., 1954, 25, 1281.

April 8, 1959

Card 9/9

SUBMITTED:

VLASOV, A. D.

95

8/069/62/013/006/019/027
B102/B186

AUTHORS: G. T. and M. R.

TITLE: Nauchnaya konferentsiya Moskovskogo inzhenerno-fizicheskogo
instituta (Scientific Conference of the Moscow Engineering
Physics Institute) 1962

PERIODICAL: Atomnaya energiya, v. 13, no. 6, 1962, 603 - 606

TEXT: The annual conference took place in May 1962 with more than 400 delegates participating. A review is given of these lectures that are assumed to be of interest for the readers of Atomnaya energiya. They are as follows: A. I. Leypunskiy, future of fast reactors; A. A. Vasil'yev, design of accelerators for superhigh energies; I. Ya. Pomeranchuk, analyticity, unitarity, and asymptotic behavior of strong interactions at high energies; A. B. Migdal, phenomenological theory for the many-body problem; Yu. D. Fiveyskiy, deceleration of medium-energy antiprotons in matter; Yu. M. Kogan, Ya. A. Iosilovskiy, theory of the Mössbauer effect; M. I. Ryazanov, theory of ionization losses in nonhomogeneous medium; Yu. B. Ivanov, A. A. Rukhadze, h-f conductivity of subcritical plasma;

Card 1/4

35

Nauchnaya konferentsiya...

S/089/62/013/006/019/027
B102/B186

design of 30-Mev electron linear accelerator; Ye. G. Pyatnov, A. A. Glaskov, V. G. Lopato, A. I. Finogenov, G. N. Slepakiy, V. D. Seleznev, experimental characteristics of low-energy electron linear accelerators; G. A. Zeytlenk, V. M. Levin, S. I. Piskunov, V. L. Smirnov, V. K. Khokhlov, radioicircuit parameters of Ny3(LUE)-type accelerators; G. A. Tyagunov, O. A. Val'dner, B. M. Gokhberg, S. I. Korshunov, V. I. Kotov, Ye. M. Moroz, accelerator classification and terminology; O. S. Milovanov, V. B. Varaksin, P. R. Zenkevich, theoretical analysis of magnetron operation; A. G. Tragov, P. R. Zenkevich, calculation of attenuation in a diaphragmated waveguide; Yu. P. Lazarenko, A. V. Ryabtsev, optimum attenuation length for linear accelerator; A. A. Zhigarev, R. Ye. Yeliseyev, review on trajectographs; I. G. Morozova, G. A. Tyagunov, review on more than 500 ion sources; M. A. Abroyan, V. L. Komarov, duoplasmatron-type source; V. S. Kuznetsov, A. I. Solnyshkov, calculation and production of intense ion beams; V. M. Rybin (Ye. V. Armentskiy), inductive current transmitters of high sensitivity; V. I. Korota, G. A. Tyagunov, kinetic description of linear acceleration of relativistic electrons; A. D. Vlasov, phase oscillations in linear accelerators; E. L. Burshteyn, O. V. Voskresenskiy, beam field effects in the waveguide of an electron linear accelerator; R. S. Bobovikov,

Card 3/4

L 12956-63
IJP(C)/ATENG(k)/EWT(1)/BDS/ES(w)-2 AFFTC/ASD/ESD-3/SSD Pz-4/Pab-4
S/109/63/008/004/026/030

67

AUTHOR:

Vlasov, A. D.

TITLE:

On computing wave parameters of electron beams with a high density
space charge

PERIODICAL:

Radiotekhnika i elektronika, v. 8, no. 4, 1963, 718-720

TEXT: The author explains that modern UHF devices are largely based on the linear theory of the space charge of electron beams as developed by W. C. Hahn and S. Ramo, to whose work he refers in his bibliography. He points out, however, that a simplified modification of this theory is usually used, based on the assumption that the plasma frequency ω_p is extremely small as compared with the working frequency ω . With the increase in power of UHF devices as well as the use of tubular beams, the density of the space charge increases many times and the condition that $\omega_p \ll \omega$ is, more and more often, not fulfilled. This, the author says, is the reason for the growing discrepancy between the theoretical and experimental results in this area. In figuring wave parameters, he says, we can no longer go on the assumption that ω_p is that much smaller than ω . He then proceeds to show, mathematically, how this plasma density factor can be taken into account, with a

Card 1/2

L 12956-63

S/109/63/008/004/026/030

On computing wave

resulting precise determination of wave parameters which varies as much as 10% from values previously obtained. This, the author says, makes it possible to achieve much greater accuracy in computing other relevant parameters of the electron beam, such as electron conductivity introduced by the beam in passing through a resonator.

SUBMITTED: June 25, 1962

Card 2/2

L 10268-63

ACCESSION NR: AP3000571

S/0109/63/008/005/0870/0873

AUTHOR: Vlasov, A. D.

44

TITLE: Calculating the conductance due to the electron beam in a resonator

SOURCE: Radiotekhnika i elektronika, v. 8, no. 5, 1963, 870-873

TOPIC TAGS: klystron, electron-beam calculations

ABSTRACT: Shunt conductance due to the electron beam has been calculated from two different formulas described in German (A. Bers, Mikrowellenrohren, s. 53, Braunschweig, Fr. Vieweg u. Sohn, 1961) and in American (G. M. Branch, IRE Trans., 1961, ED-8, 3, 193) literature. The article clarifies the connection between the two formulas, evaluates their accuracy, and introduces improvements that permit either formula to be used for calculating tubular beams. Orig. art. has: 13 equations.

ASSOCIATION: none

SUBMITTED: 26Aug62

DATE ACQD: 30May63

ENCL: 00

SUB CODE: CO

NO REF SOV: 001

OTHER: 003

Card 1/1 ja/nh

44140
h2122S/109/62/007/010/009/012
D266/D308

AUTHORS: Vlasov, A.D., and Belov, N.Ye.

TITLE: Quality factor of the amplifier stages and of the output circuit of a wide band klystron

PERIODICAL: Radiotekhnika i elektronika, v. 7, no. 10, 1962,
1787 - 1794

TEXT: The purpose of the paper is to discuss the design of a multi-cavity klystron resulting in an optimum gain-bandwidth factor. The optimization is carried out for two parameters Φ and Ψ , where the former is concerned with the amplifying stages and the latter solely with the output circuit. The definitions are as follows

$$\Phi = \frac{1}{Q} k \quad \text{and} \quad \Psi = \frac{1}{Q} \eta,$$

where $1/Q$ - 3 db bandwidth, k - gain of a single stage, η - electronic efficiency. Assuming staggering tuning but otherwise identical stages, $1/Q$ and k represent averaged values. The calculations are performed for an annular beam of electrons (outer radius a , and

Card 1/3

S/109/62/007/010/009/012
D266/D308

Quality factor of the amplifier ...

inner radius b) moving in a tunnel. The resonators are of the usual reentrant type, where R/Q is approximated by the following formula

$$\frac{R}{Q} = C_2 \left(\frac{21}{d} \right)^{\epsilon_2} \quad (8)$$

where 21 - width of the interaction gap, d - inner diameter of the drift tube, C_2 , ϵ_2 - constants, taken in one particular case as $C_2 \approx 110$ and $\epsilon_2 \approx 0.3$. Similar approximation is used for the plasma frequency reduction factor which is written in the form

$$F = C_1 \rho^{\epsilon_1} \quad (7)$$

where C_1 , ϵ_1 - constants and ρ is the normalized mean radius, defined as

$$\rho = \frac{\omega}{v} \cdot \frac{a+b}{2} \sqrt{1 - \beta^2},$$

where ω - angular frequency, v - beam velocity, $\beta = v/c$, c - velocity of light. The gap coupling coefficient is taken as

Card 2/3

Quality factor of the amplifier

APPROVED FOR RELEASE: 03/14/2001

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D266/D308

$$M = \frac{I_0(\rho)}{I_0(\xi\rho)} J_0(\alpha)$$

(9)

where I_0 , J_0 - Bessel functions, $\xi = a/b$, $\alpha = \frac{\omega l}{v} \cdot \Phi$ and Ψ are then expressed with the aid of the above parameters and means for maximizing them are investigated. There is a transit angle which optimizes both Φ and Ψ but generally only one of them can be optimized and a compromise must be sought. The optimum value of the permeance is often not realizable and then permeance must be chosen on practical considerations and the value of transit angle optimized later. No complete design is described, but the author claims that the application of the method is straightforward. There are 2 figures.

SUBMITTED: June 27, 1961

Card 3/3

S/089/62/013/002/008/011
B102/B104

AUTHORS: Rafal'skiy, R. P., Vlasov, A. D., Kudinova, K. F.

TITLE: UO_2 synthesis by U(VI) reduction with elementary sulfur under hydrothermal conditions

PERIODICAL: Atomnaya energiya, v. 13, no. 2, 1962, 181-183

TEXT: U(VI) U(IV) reduction in uranyl sulfate solutions by sulfur vapor is described. Altogether 13 experiments were made under various conditions, and in particular with different periods of heating, at a molar ratio U:S = 1:1. The sulfur vapor pressure corresponded to the vapor saturation pressure. The heating temperatures in the autoclave were 360°C, or in 2 cases 200°C, and the heating periods varied between 1 and 72 hrs. U-concentration in the initial solution was 25, or in one case 100 g/l; pH was 2.3 (or in individual cases 0.5, 1.7, 0.8); the solution volume was 20-30 ml (3.5, 9); and the uranium concentration in the final solution was between 0.001 and 18.5 g/l. In all cases the synthesis products were studied using X-rays. It is shown that U(VI)-S interaction at 360°C during 20 hrs and more causes virtually complete uranium reduction (25 g/l

Card 1/2

UO_2 synthesis by U(VI) reduction ...

S/089/62/013/002/008/C11
B102/B104

solution volume 22 ml, pH 2.3). With heating periods of 1 and 4 hrs (360°C) (25 g/l, pH 2.3, volume of solution 21 and 9 ml) a precipitate of $\text{UO}_2 + \text{U}_3\text{O}_8$ was observed only at $t \geq 14$ hrs, and with 22-25 ml pure UO_2 was precipitated. At 200°C reduction proceeds more slowly is less complete. UO_2 precipitates in finely crystalline form (size 0.01 mm, lattice constant 5.45-5.46) U_3O_8 , somewhat more coarsely crystalline at 200°C (0.01-0.2 mm). There are 2 figures and 1 table.

SUBMITTED: November 28, 1961

Card 2/2

RAFAL'SKIY, R.P.; VLASOV, A.D.; NIKOL'SKAYA, I.V.

Possibility for the synchronous transport of U^{V1} and S by hydrothermal solutions (based on experimental data). Dokl. AN SSSR 151 no.2: 432-434 J1 '63. (MIRA 16:7)

1. Predstavleno akademikom D.S.Korzhinskim.
(Uranium) (Sulfur)
(Geochemistry)

BONDAREV, B.I.; VLASOV, A.D.

Self-consistent particle distribution and limit current in a
linear accelerator. Atom. energ. 19 no.5:423-428 N '65.
(MIRA 18:12)

VLASOV, A.D.

Calculation of the electron conductivity and wave form of a space charge. Radiotekh. i elektron. 10 no.8t3546 Ag '65.

(MIRA 18:8)

Yakovlev, Aleksandr Ivanovich (1908-1975). Soviet physicist.

Yakovlev, Aleksandr Ivanovich (1908-1975). Soviet physicist.

Theory of linear accelerators (Teoriya lineynykh uskoriteley) Moscow, Atomizdat, 1960. 1176 p. 175 mm. Frontispiece. 2,000 copies printed.

TOPIC TAGS: particle accelerator, high energy accelerator, linear accelerator, nuclear particle, electron accelerator, proton accelerator, ion accelerator, motion

TOPIC TAGS: particle accelerator, high energy accelerator, linear accelerator, nuclear particle, electron accelerator, proton accelerator, ion accelerator, motion

CONTINUED ON THE REVERSE SIDE

and 1,2

ACCESSION NR AM5013556

intended for scientists and engineers working on the design, construction and

TABLE OF CONTENTS (abridged):

| | |
|---|-------|
| Preface | — 3 |
| Conventional symbols | — 4 |
| Introduction | — 7 |
| Ch. I. Accelerating systems and motion equations | — 17 |
| Ch. II. Longitudinal motion | — 44 |
| Ch. III. Defocusing forces and focusing methods | — 103 |
| Ch. IV. Quadrupole focusing | — 117 |
| Ch. V. Alternating gradient focusing by accelerating field | — 208 |
| Ch. VI. Focusing by means of longitudinal magnetic field | — 232 |
| Ch. VII. Grid and foil focusing | — 246 |
| Ch. VIII. The mechanism and features of electron accelerators | — 262 |
| Ch. IX. Radial motion and focusing | — 280 |
| Appendix | — 298 |
| Bibliography | — 301 |

Card 2/3

VLASOV, Aleksandr Danilovich, doktor tekhn. nauky, MOLYAN, G.L.,
red.

[Theory of linear accelerators] Teoriia lineinykh uskoritelei. Moskva, Atomizdat, 1965. 306 p. (MIRA 18:4)

L 15250-65 SEC(b)-2/SPA(w)-2/SP(T')/ESD(t)
ACCESSION NR: AP5CX1202

Pab-1G BSD/ASD(a)-5/ESD(t)
S/2129/64/009/007/1234/1245

AUTHOR: Vlasov, A. D.

TITLE: Theory of nonlaminar electron flow focussed by a magnetic field ^A _B

SOURCE: Radiotekhnika i elektronika, v. 9, no. 7, 1964, 1234-1245

TOPIC TAGS: longitudinal magnetic field, particle motion, electron flow

ABSTRACT: The nonlaminar structure of an axially symmetric electron flow focussed by a longitudinal magnetic field is studied. The upper and lower limits are found for the focussing field. The well known fact that the required field is always greater than that predicted by the laminar theory of Brillouin is explained. It is shown that the flow "or a screened cathode is continuous and continuous or tubular for an unscreened cathode, depending on whether or not the cathode intersects the axis of the flow. Equations are derived for particle trajectory, and the relationship between charge density distribution and particle distribution are given for various trajectories. Author expresses thanks to G. I. Minin. Trig. art. has: 33 formulas.

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ACCESSION NR: AP5001202

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ASSOCIATION: none

SUBMITTED: 22Apr63

ENCL: 00

SUB CODE: NP,EM

NO REF SOV: 002

OTHER: 006

JPRS

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L 18937-65 EWT(m)/EPF(n)-2/EWP(t)/EWP(b) Pu-4 IJF(s)/AEDC(s) JD/JG/MW/ES

ACCESSION NR: AP5003162

5/0078/64/009/009/2222/2230

11
B

AUTHOR: Vlasov, A. D.; Rafal'skiy, R. P.

TITLE: Study of the system $\text{UO}_2\text{SO}_4\text{-S-H}_2\text{O-(SiO}_2)$ at high temperature and pressures

SOURCE: Zhurnal neorganicheskoy khimii, v. 9, no. 9, 1964, 2222-2230

TOPIC TAGS: uranium, uranium compound, sulfur compound, high temperature effect, pressure effect

ABSTRACT: The authors studied the relationship of equilibrium concentrations to temperature and initial concentration for hexavalent uranium. The concentrations of uranium decrease with rising temperature: abruptly at $100-200^\circ$, and smoothly at $T > 200^\circ$. As initial concentrations increase, the equilibrium concentrations also increase. This rise is less pronounced at high temperatures.

In the system $\text{H}_2\text{SO}_4\text{-UO}_2\text{-S-H}_2\text{O}$ at 200° , the concentrations of uranium in solution are close to the corresponding equilibrium concentrations in the system $\text{UO}_2\text{SO}_4\text{-S-H}_2\text{O}$ (for the same molalities of H_2SO_4 and UO_2SO_4). The identity of these systems was thus experimentally demonstrated.

Using an analysis of the relations $c = f(c_0)$, the authors set up equations for the reactions taking place in the system $\text{UO}_2\text{SO}_4\text{-S-H}_2\text{O}$ at 100,

Card 1/2

L 18937-65
ACCESSION NR: AF5003162

150, and 200°. The equilibrium constants and changes in free energy of these reactions were calculated for 150 and 200°.

The composition of the reaction products in the system UO_2SO_4 -8-H₂O changes with rising temperature from 80° at 100° to polythionic acids or other high-oxygen compounds of sulfur at 360°, i.e., toward the formation of sulfur of higher valency states. Orig. art. has: 1 figure, 6 formulas, 9 graphs, 3 tables.

ASSOCIATION: none

SUBMITTED: 18Apr63

ENCL: 00

SUB CODE: IC, GC

NO REF Sov: 003

OTHER: 003

JPRS

Card 2/2

VLASOV, A.D., doktor tekhn. nauk (Moskva)

Eminent Soviet radiotechnologist and electronics expert; 70th
birthday of Academician A.L. Mints. Priroda 54 no.1:120-121
Ja '65. (MIRA 18:2)

VLASOV, A.D.

System UO_2 - Na_2CO_3 - CO_2 - H_2O - (SiO_2) at elevated temperatures
and pressures. Zhur. neorg. khim. 9 no.8:1980-1987 Ag 164.
(JINR 17:11)

VLASOV, A.P.

Organization of service given by the North Caucasian
Hydrometeorological Administration to agricultural administrations.
Meteor. i gidrol. no.4:40-41 Ap '63. (MIRA 16:5)

1. Severo-Kavkazskoye Upravleniye gidrometeorologicheskoy
sluzhby.
(Caucasus, Northern—Hydrometeorology)(Caucasus, Northern—Agriculture)

MALIKOVA, V.F.; BATOVA, V.M., starshiy inzh.-klimatolog; MORDUKHAY-BOLTOVSKIY, D.P.; VLASOV, A.F., otv.red.; NEDOSHIVINA, T.G., red.; SERGEYEV, A.N., tekhn.red.

[Agroclimatic manual for the Kabardino-Balkar A.S.S.R.] Agroklimaticheskii spravochnik po Kabardino-Balkarskoi ASSR. Leningrad, Gidrometeor.izd-vo, 1960. 135 p.

(MIRA 14:4)

1. Russia (1923- U.S.S.R.) Glavnaya upravleniya gidrometeorologicheskoy sluzhby. Severo-Kavkazskoye upravleniya. 2. Rostovskaya gidrometeorologicheskaya observatoriya (for Malikova, Batova, Mordukhay-Boltovskiy). 3. Nachal'nik otdela agrometeorologii Rostovskoy gidrometeorologicheskoy observatorii (for Malikova). 4. Nachal'nik otdela hidrologii Rostovskoy gidrometeorologicheskoy observatorii (for Mordukhay-Boltovskiy).

(Kabardino-Balkar A.S.S.R.--Crops and climate)

VLASOV, A.F.

Results achieved by hydrometeorological stations in supplying collective and state farms with agrometeorological information. Meteor. i gidrol. no.10:38-40 O '60. (MIRA 13:10)
(Meteorology, Agricultural)

VLASOV, A.F.

Increasing the flowability of molding mixtures by modified suspension.
Lit.proizv. no.4:5-6 Ap '63. (MIRA 16:4)
(Sand, Foundry--Additives)

VLASOV, A.F.; GRANOVSKIY, G.I., prof., retsenzent; ROSSIYANOV, D.D., inzh.,
retsenzent; BROMLEY, M.F., kand. tekhn. nauk, red.; SMIRNOVA, G.V.,
tekhn. red.

[Removing dust and chips in machining brittle materials] Udalenie pyli
i struzhki pri obrabotke khrupkikh materialov, Moskva, Gos. nauchno-
tekhn. izd-vo mashinostroit. lit-ry, 1961. 130 p. (MIRA 14:8)
(Metal cutting)

VLASOV, A.F.

AUTHORS: Vikhoreva, T.A., and Vlasov, A.F., Engineers 128-58-4-11/18

TITLE: Experience with Exothermally-Heated Feeding Heads (Opyt prime-neniya pribyley s ekzotermicheskim obogrevom)

PERIODICAL: Liteynoye Proizvodstvo, 1958, No. 4, pp 25-26 (USSR)

ABSTRACT: The article gives information on a new exothermal compound for heating feeding heads of steel castings which has reduced the metal waste by 50% and also greatly reduced the number of rejects. Its composition, in weight percentage is: powder aluminum 10%, 75-percent ferrosilicon 13%, iron scale 62%, refractory clay powder 8%, fire clay 7%. Addition of 3-5% sulphite lye and 1% water is made to increase the strength of the compound in dry condition. Recommendations are given concerning the dimensions and weight of feeding heads, and the granulation of exothermal compound components. The compound is considerably cheaper than the ordinary exothermal compounds containing more aluminium powder, the burning reaction in the process of pouring is quiet, the remains of the compound partly float to the metal surface in feeding heads and form a readily removable slag. An illustration shows a casting with ordinary feeding heads and one which was exothermally

Card 1/2

Experience with Exothermally-Heated Feeding Heads

128-58-4-11/18

heated by using the above mentioned compound.
There are 2 figures.

AVAILABLE: Library of Congress

Card 2/2 1. Steel castings-Test methods 2. Steel castings-Test results

VLASOV, A

F

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741.41
.V81

Tekhnika Bezopasnosti Pri Rabote na Metallorezchushchikh Stankakh
(Safety Techniques for Work With Metal-cutting Machine Tools) Moskva,
Mashgiz, 1951.

199 p. illus., diagrs., tables.
Literatura: P. 193- (194)

VLA... (✓, H1)

VLASOV, A. F.

Tekhnika bezopasnosti pri obrabotke metallov rezaniem [Safety techniques in metal cutting]. Pod red. A. V. Pankina. Moskva. Profizdat, 1952. 72 p.

SO: Monthly List of Russian Accessions. Vol. 6 No. 7 October 1953

1. ALEKSEEV, E. G., VLASOV, A. F., GRACHEV, L. N.
2. USSR (600)
4. Lathes - Safety Appliances
7. Safety devices for lathes. Stan. i instr. 24, No. 2, 1953.

9. Monthly List of Russian Accessions, Library of Congress, May 1953. Unclassified.

Vlasov, Aleksandr Filippovich

VLASOV, Aleksandr Filippovich; DENISOVA, I., redaktor; KIRSANOV, N.,
tekhnicheskiy redakte

[Safety engineering for metal cutting] Tekhnika bezopasnosti pri
obrabotke metallov rezaniem. Izd. 2-oe [Moskva] Izd-vo VTsSPS Pro-
fizdat, 1954. 74 p.
(Safety engineering for metal cutting)

VLASOV, Aleksandr Filippovich; PANKIN, A.B., professor, doktor tekhnicheskikh
nauk, redaktor; DENISOVA, I.S., redaktor; RAKOV, S.I., tekhnicheskiy
redaktor

[Safety techniques in high-speed metal grinding] Tekhnika bezopasno-
sti pri skorostnom tochenii metallov. Pod red. A.V.Pankina. [Moskva]
Izd-vo VTsSPS Profizdat, 1954. 124 p. (MLRA 8:3)
(Metal industries--Safety measures)

VLASOV, Aleksandr Filippovich; VESELKINA, A.A., redaktor; KIRSANOV, N.A.,
tekhnicheskij redaktor

[Principles of safety engineering] Osnovy tekhniki bezopasnosti.
[Moskva] Izd-vo VTsSPS Profizdat, 1956. 106 p. (MLRA 10:3)
(Accidents--Prevention)

VLASOV A.F.

ZLOBINSKIY, B.M.; TRUKHANOV, A.A., doktor tekhnicheskikh nauk, professor,
retsenzent; KRUKOVSKIY, V.A., dotsent, retsenzent; VLASOV, A.F.,
inzhener, retsenzent; VINOGRADSKIY, N.V., dotsent, redaktor.

[Elements of safety technique] Osnovy tekhniki besopasnosti. Moskva,
Gos. nauchno-tekhn. izd-vo mashinostroit. i sudostroit. lit-ry, 1954.
212 p. (MIRA 7:7)
(Industrial safety)

VIASOV, Aleksandr Filippovich; BARYKOVA, G.I., redaktor izdatel'stva;
SOKOLOVA, T.Y., tekhnicheskiy redaktor

[Safety measures when operating machine tools] Tekhnika bezopasnosti
pri rabote na metallorezhushchikh stankakh. Izd. 2-oe, perer.
Moskva, Gos.nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1956. 212 p.
(MIRA 9:8)

(Machine tools--Safety appliances)

RAKITIN, G.A.; VLASOV, A.F.; GLAGOLEVA, T.A., kandidat tekhnicheskikh nauk;
KOROL'KOVA, V.I., kandidat tekhnicheskikh nauk; KUZNETSOV, Ye.I.;
KUCHERUK, V.V., kandidat tekhnicheskikh nauk; PROTOPOPOV, A.P.; KHO-
TSYANOV, L.K., professor; DUBOVA, A.B., redaktor; KIRSANOVA, N.A.,
tekhnicheskiy redaktor.

[Labor protection] Okhrana truda. Izd. 2-oe, isz. Moskva Izd-vo
VTS SPS Profizdat, 1956. 278 p. (MLRA 9:5)

1. Moscow. Moskovskaya vysshaya shkola profdvizheniya. 2. Chlen-kor-
respondent Akademii meditsinskikh nauk (for Khotyanov).
(INDUSTRIAL HYGIENE) (INDUSTRIAL SAFETY)

VLASOV, Aleksandr Filippovich; BARYKOVA, G.I., redaktor izdatel'stva;
SOKOLOVA, T.F., tekhnicheskij redaktor

[Safety measures when operating machine tools] Tekhnika bezopasnosti
pri rabote na metallorezhushchikh stankakh. Izd. 2-oe, perer.
Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1956. 212 p.
(MIRA 9:8)

(Machine tools--Safety appliances)

VLASOV, Aleksandr Filippovich; DENISOVA, I.S., red.; GOLICHENKOVA, A.A.,
tekhn. red.

[Safety techniques in metal machining] Tekhnika bezopasnosti
pri obrabotke metallov rezaniem. Izd.3., perer. Moskva, Izd-vo
VTsSPS Profizdat, 1958. 92 p. (MIRA 13:1)
(Metal cutting—Safety measures)

VLASOV, Aleksandr Filippovich; DENISOVA, I.S., red.; KOROBOVA, N.D.,
tekhn.red.

[Fundamentals of safety engineering] Osnovy tekhniki
bezopasnosti. Izd.2., perer. Moskva, Izd-vo Profizdat,
1961. 207 p. (MIRA 15:5)
(Industrial safety)

VLASOV, A.F.

Conducting agrometeorological observations from a helicopter.
Metsor. i gidrol. no.1:50-52 Ja '65. (MIRA 18:2)

1. Severo-Kavkazskoye upravleniye gidrometeorologicheskoy sluzhby.

VLASOV, Aleksey Fedorovich; GAMNIK, Yevgeniy Yefimovich; BORIN,
Ivan Sergeyevich; KONONOV, D.R., red.

[Drying foundry molds and cores by means of infrared gas
burners] Sushka liteinykh form i sterzhnei gazovymi go-
relkami infrakrasnogo izlucheniia. Leningrad, 1964. 20 p.
(MIRA 17:11)

VLASOV, A.F.

Methods of improving the shakeout of water glass mixtures.
Lit. proizv. 5:36-38 My '64. (MIRA 18:3)

VLASOV, A.F., kand.tekhn.nauk

Pneumatic removal of chips and dust. Mashinostroitel'
no.8:33-38 Ag '65. (MIRA 18:11)

VLASOV, A. G.

VLASOV, A. G. - "Natural oscillations of a straight cylinder and a rectangular parallelopiped". Leningrad, 1955. Leningrad Order of Lenin State U ineni A. A. Zhdanov. (Dissertation for the Degree of Doctor of Physicochemical Science.)

SO: Knizhnaya Letopis', No. 43, 22 October 1955. Moscow

VLASOV A.C.

44702

24/2/0 PERIODICAL: Radiotekhnika i elektronika, 1959, Vol 4, No 8.
 AUTHORS: Granovskiy, V.L., Luk'yano, Sov/109-4-3-22/25
 Sirotnik, I.G.
 Report on the Second All-Union Conference on Gas Electronics

ABSTRACT: The conference was organised by the Ac.Sc.USSR, the Ministry of Higher Education and Moscow State University. It was opened by the chairman of the organising committee, N.A. Leshchitsch, Academician. During the plenary sessions of the conference, a number of survey papers were delivered. L.A. Afrikhovich read a paper on "Production of Ultra-high Temperatures in Plasma". A survey of the optical method of measurements was given. A survey of the physical method and S.E. Fritch. In the paper by V.A. Fabrikant and S.E. Fritch, is the paper by the Massachusetts Institute of Technology S. Brown of the Massachusetts Institute of Technology gave a survey of the high-frequency study of the investigation of stationary and non-stationary plasma (see p 134 in this issue of the journal). In this issue of the journal, a paper entitled "Ionisation and Ionization During Atomic Collisions". X. Ianculescu, Sertierici and Yu.M. Lazar deal with "Elementary Processes of Determining the Motion of Ions in Gas". A paper by Yu. Bedroev (Romania) dealt with "The Role of Resonance Recharging in the Kinetics of Ions".

I.S. Blatkovskiy organised the initial stages of the development of sparks (corona-leader, main channel and the final channel). M.V. Fedorovskiy read a paper on "Ignition processes of the discharges in highly rarefied gases". The mechanism of the breakdown of a high-vacuum gap was elucidated in a paper by V.L. Granovskiy. The motion of L. Tonka (USA) expounded a theory of the motion of electrons in a magnetic trap (see p 136 of this journal). Academician R. Rompe (Eastern Germany) described a number of experiments on non-stationary plasma conducted by Blasius. M. Steinbeck (Eastern Germany) gave a generalised theory of plasma. The conference was divided into six sections. The first section was presided over by M.A. Sene and was concerned with the elementary processes in gas discharges. The following papers were read in this section: Ya.M. Pospel - "Transformation of Positive Ions into Negative Ions in Rarefied Gas"; Ya. M. Pospel with V.A. Antukhov and D.V. Pilitzko - "Capture and Loss of Electrons During the Collision of Fast Atoms or Carbon and Hydrogen with the Molecules of Gases".

M.V. Fedorovskiy et al. - "Dissociation or Molecular Ions of Hydrogen During Collision". Cross-sections of the electrons and Ya.S. Solov'yev - "Capture of Electrons in Multicharge Ions in Inert Gases". B.M. Kustanov et al. - "Experimental Investigation of the Resonance Recharging in Certain Single-atom Gases and Metal Vapours". O.B. Pirion - "Qualitative Investigation of Inelastic Collision of Atoms".

Leh. Volkov - "Electron Cross-sections of the Spectral Lines of Potassium and Argon". I.P. Sagnac and S.M. Kiselev - "Some Results of the Investigation of the Optical Functions of the Excitation Bands of a Negative System".

A.A. Afrikhovich and A.G. Vlasov - "Investigation of the Scattering of the Electron in a Betatron Chamber". The second section was presided over by B.N. Klyarfeld and was devoted to the problems of the electrical breakdown in rarefied gases and in high vacuum. The following papers were read in this section: G.Ya. Maka-Limanov and Yu.A. Neilitshsky - "Electrostatic Control of the Ignition of Glow-discharge Tubes" (see p 137 of the journal). S.V. Petrenko et al. were concerned with the breakdown in a high-voltage mercury rectifier (see p 137 of the journal). L.G. Gulyaev - "Ignition of the Discharge in Non-uniform Fields at Low Gas Pressures" (see p 136 of the journal). A.S. Sobolev and B.N. Klyarfeld - "The Discharge Phenomena Between a Point and a Plane at Gas Pressures of 10^{-3} - 1 mm Hg".

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S/048/60/024/008/016/017
B012/B067

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AUTHORS:

Vlasov, A. G., Vorob'yev, A. A., Kislov, A. N.,
Meshcheryakov, R. P.

TITLE:

Investigation of the Losses in Electrons Due to
Scattering in the Residual Gas in the Accelerating
Chamber 19

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960,
Vol. 24, No. 8, pp. 1006-1012

TEXT: In the present paper the theoretical calculations of the losses in accelerated particles due to scattering in the residual gas were experimentally examined. A suggestion is made for calculating these losses. First, only the definite results of calculations according to the methods by N. M. Blachman and E. D. Courant (Refs. 5,6), J. M. Greenberg and T. H. Berlin (Refs. 7,8) and A. N. Matveyev (Refs. 9,10) are studied and compared in a Table. This comparison shows that the various methods lead to different results. The control method and the

Card 1/3

Investigation of the Losses in Electrons
Due to Scattering in the Residual Gas in the
Accelerating Chamber

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experimental apparatus are then described. Fig. 1 shows the measuring block diagram. The results of measurements are given and compared with the results of theoretical calculations. In conclusion the following is stated: character and quantitative comparison of the curves shown in Fig. 6 indicate that the losses in electrons due to scattering in the residual gas can be calculated according to the method of Greenberg and Berlin as well as according to that of Matveyev with sufficient accuracy since the results differ only by 1.5 \div 1.7 times from one another. According to the method of Blachman and Courant the losses in protons due to scattering in the gas may be estimated, whereas for the electrons the values obtained by this method are too low. The sufficient agreement between the experimental and the theoretical results also confirm the correctness of the method of measurement chosen. V. G. Shestakov assisted in the measurements. The collaborators of the NII TPI and FTF assisted the authors in this work. There are 6 figures, 1 table, and 15 references: 8 Soviet and 7 British.

Card 2/3

Investigation of the Losses in Electrons
Due to Scattering in the Residual Gas in the
Accelerating Chamber

82839
S/048/60/024/008/016/017
B012/B067

ASSOCIATION: Nauchno-issledovatel'skiy institut pri Tomskom
politekhnicheskem institute im. S. M. Kirova (Scientific
Research Institute at the Tomsk Polytechnical Institute
imeni S. M. Kirov)

Card 3/3

89694

S/139/61/000/001/002/018
EO32/E514

26.2331

AUTHOR: Vlasov, A.G.TITLE: On the Calculation of Losses of Accelerated Particles
due to Scattering by the Residual GasPERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika,
1961, No.1, pp.20-23TEXT: N. M. Blachman and E. D. Courant (Ref.1), J. M. Greenber
and T. H. Berlin (Ref.2), A. N. Matveyev (Ref.3) and others have
calculated accelerated particle losses due to scattering by the
residual gas in the accelerator chamber. The probability that
after scattering a particle will remain in the chamber is given by

$$\Phi(\eta) = 2 \sum_{s=1}^{\infty} \frac{J_0\left(\lambda_s \frac{B_0}{b}\right)}{\lambda_s J_1(\lambda_s)} e^{-\lambda_s^2 \eta}, \quad (1)$$

where J_0 and J_1 are the Bessel functions, λ_s is the s-th root

Card 1/6

89694

S/139/61/000/001/002/018
EO32/E514

On the Calculation of Losses

of the Bessel function j_0 , B_0 is the initial amplitude of betatron oscillations, b is the linear dimension of the chamber in the direction under consideration and η is the factor describing multiple scattering. The particle losses are determined (in relative units) from the formula:

$$F(\eta) = 1 - \Phi(\eta) \quad (2)$$

The above expressions take into account elastic multiple scattering only. η can be determined from the Rutherford cross-section for elastic scattering, obtained taking the Born approximation into account. E. D. Courant (Ref.6) has shown that the use of the Born approximation may lead to an over-estimation of the cross-section and has used the elastic cross-section obtained by G. Moliere (Ref.7) to calculate η . Moreover, Courant has replaced the maximum scattering angle θ_{\max} by θ_1 , which is given by

$$\theta_1 = \frac{b \sqrt{\kappa}}{R_0 (1+\alpha)^{1/2}} \quad (3)$$

Card 2/6

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E032/E514

On the Calculation of Losses.....

In this expression $\kappa = n$ for axial oscillations and $\kappa = 1 - n$ for radial oscillations, where n is the magnetic field index, R_0 is the radius of the equilibrium orbit in centimetres and $\alpha = L/2\pi R_0$ and is the ratio of the length of the straight line sections to the length of the curvilinear sections. The expression for η then reads

$$\eta_i = \frac{\pi^2 N R_0^3 Z^2 e^4 (1 + \alpha)^2}{4 \times b^2 T_i e V} \left[\ln \frac{\theta_1^2}{\psi_{\theta_1}^2} - 1 \right], \quad (4)$$

where $\psi_{\theta_1} = 1.2 \theta_{\min} (1 + 3.33 \varphi_1^2)^{1/2}$; $\varphi_1 = \frac{Z}{137 \beta}$; θ_{\min} is the minimum scattering angle, N is the number of atoms per cc in the chamber, T_i is the injection energy in eV, Z is the atomic number of the residual gas and eV is the energy communicated to the particle per revolution in electron volts. The present author points out that the use of the Moliere (Ref.7) cross-section complicates the

Card 3/6

89694

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E032/E514

On the Calculation of Losses.....

matter very considerably. For this reason the present author has used the cross-section obtained by Mott (Refs. 9 and 10) on the basis of the Thomas-Fermi statistical model. On this approach, η is given by

$$\eta_2 = \frac{\pi^2 N R_0^3 z^2 e^4 (1+\alpha)^2}{2 \pi b^2 T_i \text{eV}} \ln \frac{\theta_1}{\theta_{\min}} \quad (6)$$

Numerical calculations have shown that the values of η calculated from Eq.(6) differ by only 3 to 5% from those obtained from Courant's formula (Eq.4). On the other hand, calculations based on Eq.(6) are very much simpler. It follows that in order to calculate particle losses by the Blachman-Courant method, it is convenient to use the cross-section obtained by Mott and to calculate η from Eq.(6). The present author reports detailed numerical data for particle losses in the following accelerators: proton-synchrotron of the Joint Institute for Nuclear Studies (Dubna, USSR), the cosmotron (Brookhaven, USA), proton-synchrotron of the Birmingham University, synchrotron of the California

Card 4/6

89694

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E032/E514

On the Calculation of Losses.....

University (Pasadena, USA), Berkeley synchrotron (USA), and the betatron of the Tomsk Scientific Research Institute (USSR). It is shown that losses due to radial oscillations in electron accelerators are comparable with those due to axial oscillations, while for proton accelerators they are considerably smaller, since the radial dimension of the chamber in the case of proton accelerators is 3 to 4 times larger than the vertical dimension. It is essential to take into account radial oscillations in the case of the electron accelerators. The pressure in the vacuum chamber should normally be chosen so that particle losses due to scattering by residual gas should not exceed 10 to 15%. The total losses calculated by the Blachman-Courant method, modified as indicated above, differ from the experimental results by not more than 30%. It follows that for engineering purposes the above method is quite adequate. Acknowledgments are expressed to Doctor Professor A. A. Vorob'yev for discussions and valuable advice. There are 2 tables and 11 references: 4 Soviet, 7 non-Soviet.

ASSOCIATION: NII pri Tomskom politekhnicheskem institute imeni S.M.Kirova (Scientific Research Institute of the Tomsk Polytechnical Institute imeni S. M. Kirov)

Card 5/6

89694

On the Calculation of Losses.....

S/139/61/000/001/002/018
E032/E514

SUBMITTED: February 15, 1960

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Card 6/6

22784

S/057/61/031/005/015/020
B104/B205

21200

AUTHOR: Vlasov, A. G.TITLE: Effect of pressure in a vacuum chamber on the radiation
intensity of accelerators

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 5, 1961, 613-615

TEXT: Experiments with a betatron having a radiant energy of 15-25 Mev, performed at the Tomskiy politekhnicheskiy institut (Tomsk Polytechnic Institute), have shown that, at pressures of $(1 - 2) \cdot 10^{-5}$ mm Hg, emission is virtually lacking, intensity increases considerably with a pressure drop to $(3 - 5) \cdot 10^{-6}$ mm Hg, and that intensity does not increase very much with further decrease of pressure. The parameters of the accelerator are listed in the accompanying table. For a smooth operation of the accelerator, a pressure of $(2 - 4) \cdot 10^{-6}$ mm Hg is required; further improvement of the vacuum is superfluous. An increase of the injection energy raises the radiation intensity at one and the same pressure. The loss of electrons due to scattering by molecules and atoms of the residual gas in the chamber of the betatron at 15-25 Mev was calculated.

Card 1/4

22784

S/057/61/031/005/015/020
B104/B205

Effect of pressure in a...

The methods of calculation, originally intended for the calculation of proton losses, were taken from a paper by Blachman et al. (Phys.Rev., 74, 140, 1948; 75, 305, 1949). In calculating the electron losses the author had to take account of both elastic and inelastic collisions. Furthermore, radial and axial oscillations have been considered. Theoretical and experimental values are intercompared in Fig. 2 and were found to be in good agreement. Summing up, it is noted that every accelerator exhibits a critical pressure at which its emission will vanish. It is advisable to evacuate the chamber of the accelerator down to a certain pressure limit, since a lower vacuum would be useless. For the betatron in question, this value is $(2 - 3) \cdot 10^{-6}$ mm Hg. The theoretically calculated losses amount to 6-8% but the experimental ones are somewhat higher. This is due to factors that have not been taken into account, such as disturbances of the magnetic field, initial spread on injection, etc. Doctor A. A. Vorob'yev is thanked for a discussion, and Engineers R. P. Meshcheryakov and G. M. Tsyb for assistance in experiments. There are 2 figures, 1 table, and 12 references: 5 Soviet-bloc and 7 non-Soviet-bloc. The two references to English-language publications read as follows: E. Courant, Rev.Sci.Instr., 24, 836, 1953;

Card 2/4

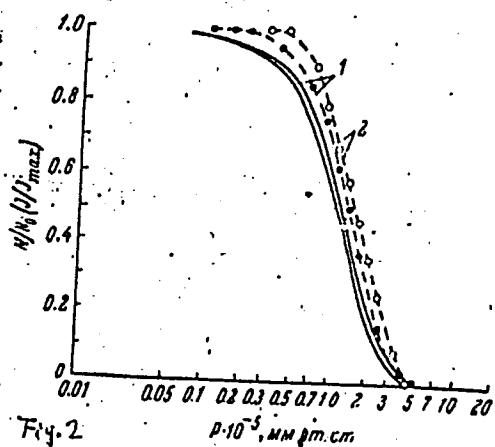
Effect of pressure in a...

22784
S/057/61/031/005/015/020
B104/B205

Mullett, L.B., A.E.R. E., GP/R, 2072, 1959.

SUBMITTED: May 26, 1960

Legend to Fig. 2: Theoretical dependence of electron losses on scattering by the residual gas in the chamber of the betatron.



Card 3/4

VLASOV, A.G.; PONOMAREV, V.P.; SHIVYRTALOV, M.T.; SHCHENIN, P.M.

Vacuum systems for electron accelerators. Izv. TPI
122:99-107 '62. (MIRA 17:9)

VLASOV, A.G.; SHERSTYUK, A.I.

Theoretical investigation of the possibility of applying the method of differential thermal analysis to the quantitative study of the crystallization process. Stekloobr. sost. no.1:116-119 '63.

(MIRA 17:10)

S/058/63/000/001/013/120
A062/A101

AUTHOR:

Vlasov, A. G., Kislov, A. N., Meshcheryakov, R. P.

TITLE:

Apparatus for measuring short-life isometric transitions.

PERIODICAL:

Referativnyy zhurnal, Fizika, no. 1, 1963, 37, abstract 1A353
(In collection: "Elektron. uskoriteli". Tomsk, Tomskiy un-t, 1961,
288 - 291)

TEXT:

Apparatus for measuring short-life isometric transitions is described. The measurements were carried out on a betatron of 25 MeV maximum energy. The apparatus comprised a cutting-off circuit which permitted also the control of the maximum energy of bremsstrahlung and the prevention of the error due to oscillations of the radiation intensity, a scintillation spectrometer operating with a pulse supply, an amplitude analyzer and a 16-channel time analyzer. The duration of the cut-off was 3 μ sec.

K. Aglantsev

[Abstracter's note: Complete translation]

Card 1/1

L 57830-65 EPA(w)-2/EWT(m)/EWP(b)/EWA(m)-2/EWP(t) Pt-7/Pab-10 IJP(c)
ACCESSION NR: AR404046

50275 54 000 009 1000 1010
521.527

SOURCE: ref. zh. Elektronika i yeye primeneniye. Svidnyy tom, Abs. 9A46

AUTHOR: Vlasov, A. G.; Ponomarev, V. P.

TITLE: Using the titanium pumps for exhausting betatron chambers 19

CITED SOURCE: Sb. Elektron. uskoriteli. M., Vyssh. shkola, 1964, 386-391

TOPIC TAGS: titanium pump, high vacuum pump, betatron chamber

TRANSLATION: The widely-used method of obtaining high vacuum in the betatron acceleration chamber by continuous operation of a diffusion pump is not always reliable. This is due to the fact that the diffusion pump is not able to remove the residual gas in the chamber.

This method is also not reliable and cannot always be used for exhausting betatrons. A method of using titanium pumps for exhausting betatron chambers is proposed.

This method of exhausting is exemplified by a rough-vacuum pump succeeded by a special

Card 1/2

L 57430-65

ACCESSION NR: AR4049406

starter that consists of a tungsten 0.5-mm wire around which a titanium current-carrying wire is wound; the starter reduces the pressure from 10^{-2} torr to 10^{-4} torr. The pump parameters are: cathode current, 12-15 mA; collector current, 80-100 mA; collector voltage, 1-5 v; collector voltage, 1200 v, minimum pressure, 3×10^{-8} torr; time of pulse, 4 sec at 5×10^{-6} torr. The seals between the detachable units are made of fine plastic. This is permitted to attain a very tight seal in the ceramic chamber of a 25-Mev betatron. A titanium pump diagram, a half-sealed betatron chamber, and a circuit diagram for measuring gas rate and chamber leakage are presented. Bibliography: 2 titles.

ENCL: 00

SUB CODE: NP

4/10
Cord 2/2

VLASOV, A.G.; KRUPP, D.M.

Recurrence form of Seidel sums expressing the dependence of aberrations on the position of the pupil of an aspherical objective. Opt. i spektr. 18 no. 3:501-504 Mr '65.

(MIRA 18:5)

VLASOV, A. G. -

00513R001860230005-6
3704
A Magnetic Lens with Minimum Spherical
Aberration. A. G. Vlasov. (full text in
U.S.S.R. PUBLICATIONS, No. 3, pp. 235-240
In Russian). The spherical aberration of a magnetic
lens is considered, and a formula (1) for calculating
it is given. Methods are indicated for deriving
conditions under which spherical aberration would
be a minimum. The case of a "short" magnetic
lens is discussed in greater detail, and the shape
of the pole shoes satisfying the required conditions
is determined.

An abstract in English was noted in Dec. of July

621-485-844 3706

Calculation of the Fields of Simple Electrostatic Lenses. A. G. Vlasoff (*Itogi Nauki i Tekhniki, Fizika, 1954, Vol. 8, No. 3, pp. 249-262*. In Russian) Lenses are considered which represent systems of (a) a number of plane metallic electrodes perpendicular to the optical axis, and having circular apertures with their centres on the optical axis and (b) a number of cylindrical surfaces with their axes coinciding with the optical axis. A function is found satisfying Laplace's equation within the space bounded by the electrodes, and passing through given values at the electrodes. It is shown that the problem can be reduced to that of Dirichlet for the case of a cylinder, and, starting from Laplace's equation, a solution (10) is found which satisfies all conditions of Dirichlet's problem.

An abstract in English was noted in 1943 of July

VLASOV, A.

"Calculation of Fields of the Simplest Electrostatic Lenses" and "A Short Magnetic Lens with a Minimum Spherical Aberration," both abstracts of papers of the Acad. Sci., USSR. Published in J. Phys., USSR, 1945, Vol 9, No 1, p 60.

SO: Wireless Engineer, Vol 23, No 274, Jul 46

3934. INFLUENCE OF ELECTRODE PRECIPITATION ON OPERATION OF ELECTRICAL PRECIPITATORS. Vlasov, A. and Kaptsov, N. (J. Tekhn. Fiz., Nov. 1947, vol. 17, 1371-1380). Experimental investigations have shown that a layer of non-conducting particles on the electrode of a precipitator distorts the field distribution in the corona zone. Measurements indicate that the outer corona layer is charged to a certain potential, depending on the properties of the precipitate, thickness of the layer and corona current. The tests were carried out with reference to negative corona discharge.

E.R.A.

V.L. 1/22

PHASE I BOOK EXPLOITATION SOV/5035

Vsesoyuznoye soveshchaniye po stekloobraznomu sostoyaniyu. 3d, Leningrad, 1959.

Stekloobraznoye sostoyaniye; trudy Tret'yego vsesoyuznogo soveshchaniya Leningrad, 16-20 noyabrya 1959 (Vitreous State; Transactions of the Third All-Union Conference on the Vitreous State, Held in Leningrad on November 16-20, 1959) Moscow, Izd-vo AN SSSR, 1960. 534 p. Errata slip inserted. 3,200 copies printed. (Series: Its: Trudy)

Sponsoring Agencies: Institut khimii silikatov Akademii nauk SSSR. Vsesoyuznoye khimicheskoye obshchestvo imeni D.I. Mendeleyeva and Gosudarstvennyy ordena Lenina opticheskiy institut imeni S.I. Vavilova.

Editorial Board: A.I. Avgustinik, V.P. Barzakovskiy, M.A. Bezborodov, O.K. Botvinkin, V.V. Vargin, A.G. Vlasov, K.S. Yevstrop'yev, A.A. Lebedev, M.A. Matveyev, V.S. Molchanov, R.L. Myuller, Ye.A. Poray-Koshits, Chairman, N.A. Toropov, V.A. Florinskaya, A.K. Yakhkind; Ed. of Publishing House: I.V. Suvorov; Tech. Ed.: V.T. Bochever.

PURPOSE: This book is intended for researchers in the science and technology of glasses.

~~Card 1/22~~

Vitreous State (Cont.)

SOV/5035

COVERAGE: The book contains the reports and discussions of the Third All-Union Conference on the Vitreous State, held in Leningrad on November 16-19, 1959. They deal with the methods and results of studying the structure of glasses, the relation between the structure and properties of glasses, the nature of the chemical bond and glass structure, and the crystallochemistry of glass. Fused silica, mechanism of vitrification, optical properties and glass structure, and the electrical properties of glasses are also discussed. A number of the reports deal with the dependence of glass properties on composition, the tinting of glasses and radiation effects, and mechanical, technical, and chemical properties of glasses. Other papers treat glass semiconductors and soda borosilicate glasses. The Conference was attended by more than 300 delegates from Soviet and East German scientific organizations. Among the participants in the discussions were N.V. Solomin, Ye. V. Kuvshinskiy, Yu.A. Gastev, V.P. Pryanishnikov, Yu. Ya. Gotlib, O.P. Mchedlov-Petrosyan, G.P. Mikhaylov, S.M. Petrov, A.N. Lazarev, D.I. Levin, A.V. Shatilov, N.T. Ploshchinskiy, A.Ya. Kuznetsov, E.V. Degtyareva, G.V. Byurganovskaya, A.A. Kalenov, M.M. Skornyakov, P.Ya. Bokin, E.K. Keller, Ya.A. Kuznetsov, V.P. Pozdnev, R.S. Shevelevich, Z.G. Pinsker, and O.S. Molchanova. The final session of the Conference was addressed by Professor I.I. Kitaygorodskiy, Honored Scientist and Engineer, Doctor of Technical Sciences. The following

Card 2/22

Vitreous State (Cont.)

SOV/5035

institutes were cited for their contribution to the development of glass science and technology: Gosudarstvennyy opticheskiy institut (State Optical Institute), Institut khimii silikatov AN SSSR (Institute of Silicate Chemistry, AS USSR), Fizicheskiy institut AN SSSR (Physics Institute AS USSR), Fiziko-tehnicheskiy institut AN SSSR (Physicotechnical Institute AS USSR), Institut fiziki AN BSSR, Minsk (Institute of Physics, Academy of Sciences, Belorusskaya SSR, Minsk), Laboratory of Physical Chemistry of Silicates of the Institut obshchey i neorganicheskoy khimii AN BSSR, Minsk (Institute of General and Inorganic Chemistry, Academy of Sciences, Belorusskaya SSR, Minsk), Institut vysokomolekulyarnykh soyedineniy AN SSSR (Institute of High Molecular Compounds, AS USSR), Gosudarstvennyy institut stekla (State Institute for Glass), Gosudarstvennyy institut steklovolokna (State Institute for Glass Fibers), Gosudarstvennyy institut elektrotehnicheskogo stekla (State Institute for Electrical Glass), Sibirskiy fiziko-tehnicheskiy institut, Tomsk (Siberian Physicotechnical Institute, Tomsk), Leningradskiy gosudarstvennyy universitet (Leningrad State University), Moskovskiy khimiko-tehnologicheskiy institut (Moscow Institute of Chemical Technology), Leningradskiy tekhnologicheskiy institut im. Lensoveta (Leningrad Technological Institut imeni Lensoveta), Belorusskiy politekhnicheskiy institut Minsk (Belorussian Polytechnic Institute, Minsk), Novocherkasskiy politekhnicheskiy institut (Novocherkassk Polytechnic Institute), and Sverdlovskiy politekhnicheskiy institut (Sverdlovsk

Card 3/22

Vitreous State (Cont.)

SOV/5035

Polytechnic Institute). The Conference was sponsored by the Institute of Silicate Chemistry AS USSR (Acting Director - A.S. Gotlib), the Vsescyuznoye khimicheskoye obshchestvo im. D.I. Mendeleyeva (All-Union Chemical Society imeni D.I. Mendeleyev), and the Gosudarstvennyy ordena Lenina opticheskiy institut imeni S.I. Vavilova (State "Order of Lenin" Optical Institute imeni S.I. Vavilov). The 15 resolutions of the Conference include recommendations to organize a Center for the purpose of coordinating the research on glass, to publish a new periodical under the title "Fizika i khimiya stekla" (Physics and Chemistry of Glass), and to join the International Committee on Glass. The Conference thanks A.A. Lebedev, Academician, Professor, and Chairman of the Organization of Committee; Ye.A. Poray-Koshits, Doctor of Physics and Mathematics, Member of the Organizational Committee; and R.L. Myuller, Doctor of Chemical Sciences, Member of the Organizational Committee. The editorial board thanks G.M. Bartenev, M.V. Vol'kenshteyn, L.I. Demkina, D.P. Dobychin, S.K. Dubrovo, V.A. Ioffe, and B.T. Kolomiyets. References accompany individual reports.

Card 4/22

Vitreous State (Cont.)

SOV/5035

TABLE OF CONTENTS:

Foreword

3

GENERAL PROBLEMS OF THE VITREOUS STATE

Basic Methods and Results of Studying the Structure of Glasses

Lebedev, A.A. [Academician, Professor]. Studying the Structure of Glasses by Means of Spectral-Optical Methods 7

Poray-Koshits, Ye. A. [Doctor of Physics and Mathematics]. Diffraction Methods for Studying Vitreous Substances 14

Vogel, W. [Schott Glass Works in Jena, German Democratic Republic]. On the Cellular Structure of Glass 24

Vlasov, A.G. Natural Oscillations of the Glass Lattice and Its Structure 30

Card 5/22

Vitreous State (Cont.)

SOV/5035

| | |
|--|-----|
| Markin, Ye.P., V.V. Obukhov-Denisov, T.A. Sidorov, N.N. Sobolev, and V.P. Cheremisinov. Vibration Spectra and Structure of Glass-Forming Oxides in Crystalline and Vitreous States | 207 |
| Sidorov, T.A. Molecular Structure and Properties of Crystalline Quartz | 213 |
| Brekhovskikh, S.M., and V.P. Cheremisinov. Study of the Structure of Lead Borate and Bismuth Borate Glasses With the Aid of Infrared Spectroscopy | 219 |
| Vlasov, A.G. Quantitative Correlation of the Ordered and Disordered Phases in Glass | 222 |
| Bagdyk'yants, G.O., and A.G. Alekseyev. Electron Diffraction Study of Vitreous Silica and Lead Silicate Glasses | 226 |
| Kolyadin, A.I. Anomalous Scattering of Light in Glass | 230 |

Card 10/22

Vitreous State (Cont.)

SOV/5035

Discussion

522

Final Session of the Conference

On the State and on the Further Tasks Connected With the Solution of Glass
Structure Problems (Resolution of the Third All-Union Conference Held
During November 16-21, 1959)

528

AVAILABLE: Library of Congress

Card 22/22

JA/dwm/gmp
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15(2)

APPROVAL:

TYPE:

PRINCIPAL:

ABSTRACT:

CARE 1/4

SOY/72-59-5-1/33

None Given
Glass Science at the VIII Mendeleyev Congress
(Ruska o stekle na VIII Mendeleyevskom s'ezde)

Steklo i keramika, 1959, Nr. 5, pp 1-4 (DSRM)

In the beginning a proclamation of the FER KPS to the personnel of the building material industries for a qualitative and quantitative increase of production is mentioned. The Congress took place in Moscow in the second half of March of the current year and was devoted to the 125th anniversary of the great scholar's birthday. Outstanding chemists of the Soviet Union and the People's Democracy attended the Congress. The principal problems of the development of chemistry were discussed at the plenary meetings and the meetings of the 18 Congress sections. Professor I. A. Kitaigorodsky opened the meetings of the sub-section of glass and gave a survey of the stages of development of Soviet glass production as well as a number of promising tasks in the field of glass technology. Moreover, the following lectures were held: Doctor Koraai (People's Republic of Hungary) investigated the structure of the top-layers of glasses;

4. I. Arutyunyan (IIFI Akad. Lensoveta) discussed the formation of a family dispersive crystalline phases from the glass-like phase. V. V. Verbin and G. O. Karapetyan (GOI) reported on absorption spectra, luminescence, and photochemical properties of certain glass types. A. G. Janay (GOI) reported on the quantitative reciprocal relations between ordered and disordered phases. I. A. Paryagin (IIFI, Institute Kitaigorodsky) and D. S. Sazanov (IIFI) (Institute of Silicate Chemistry of the USSR) discussed the reasons for the disagreement on the formula of the structure of glass-like substances. Professor G. A. Batinikh, N. I. Ananich, and M. L. Mironova, Institute of Glass (IIFI) reported on the investigation of the glass structure by the method of thermal analysis and optical polarimetry. Yu. V. Podushko (GOI) discussed the method of electric glass writing and the writing of allotypes by means of high-frequency currents. Yu. G. Shcherbina reported on strontium-magnesium glasses without carbon addition for false and molten which have been developed in the Gorkovskiy Institute of Glass Industry (Gorkovskiy Institute of Glass Structure Research Institute of Ceramics). I. S. Lazareva, and V. S. Volkov (GOI) discussed the role played by the

surface protection film in the destruction of silicate glasses; and the technique of phosphorus glasses. O. V. Moshkina (IIFI) reported on the mobility of sodium ions in glasses of the system Na_2O-SiO_2 . Z. A. Moshkina (IIFI) investigated the process of substituting the glasses by lead oxide and silicon. I. G. Belikhskaya Khar'kovskiy Politekhnicheskiy Institut (Kharkov Polytechnic Institute) reported on silicate formation and silicating processes in the presence of organic layers. I. M. Tsvetkov investigated various types of glass. N. N. Sogolov (Glass Institute) reported on the determination of impurities in silicate by spectrometric analysis. G. S. Bogdanova, and Yu. M. Orlova (Glass Institute) reported on types of electrode glass which have been derived by them. Yu. V. Bogushin (Glass Institute) discussed the kinetics of the formation of crystallisation centers in photo-sensitive types of glass. I. Z. M. Svirskaya (Glass Institute) discussed the results of the investigation of the tendency of phosphorus glasses towards glass formation. L. A. Greshnik, N. V. Parovik, and V. G. Kupchenko (IIFI) reported on the investigation of types of semiconducting oxide glass on the basis of Ti_2O_5 . I. N. Sloboda, L. A. Greshnik, I. V. Sloboda, and Yu. A. Pashkov (IIFI) discussed the production of conductive (thin) types of glasses which contain components easily to be regenerated.

VLASOV, A.G., dots.; MINKEV, I.M., inzh.

Determining the electric field in a dielectric in connection with high-frequency heating. Izv.vys.ucheb.zav.; energ. 3 no.3:47-55 Mr '60. (MIRA 13:3)

1. Gosudarstvennyy ordena Lenina opticheskiy institut imeni S.I.Vavilova.
(Dielectrics) (Induction heating)

VLASOV, A.G.; KRUPP, D.M.

Calculating the fields of electron lenses. Izv. Akad. SSSR. Ser. fiz. 25
no. 6:662-664 Je '61. (MIRA 14:6)
(Electron optics)

39870

S/051/62/015/002/009/014
E032/E314

24300

AUTHORS: Yermolayev, A.M., Minkov, I.M. and Vlasov, A.G.

TITLE: A method of calculation of the optical properties of a multilayer coating with a given reflecting power

PERIODICAL: Optika i spektroskopiya, v. 13, no. 2, 1962,
259 - 265

TEXT: The authors consider the design of an n-layer coating with a given reflecting power R_N , where

$$R_N = R_N (x_0, x_1, \dots, x_N, x_{N+1}, \psi, \lambda) \quad (1)$$

x_j are the optical parameters of the media,

ψ is the angle of incidence, and

λ the wavelength.

It is required to determine the number of layers N and the magnitude of the parameters x_j for which the reflecting power

Card 1/3

S/051/62/015/002/009/014
E052/E314

A method of

$R_N(\lambda)$ in the given wavelength interval and for a given angle of incidence should be described by a given function

$$R_N(x_1, x_2, \dots x_N, \lambda) = F_o(\lambda) \quad (2)$$

The calculation starts with an assumed approximately known function $F_o(\lambda)$, which is denoted by R_m and contains the arbitrary parameters x_j . The next approximation is obtained by considering the quantities Φ_m , $m = m_o, m_o + 1, \dots$, which are given by:

$$\Phi_m(\underline{x}) = \int_{\lambda_1}^{\lambda_2} \rho(\lambda) |R_m(\underline{x}, \lambda) - F_o(\lambda)|^k d\lambda, \quad k > 0 \quad (5)$$

In this formula $\rho(\lambda) > 0$ is a weighting function,
Card 2/3 \underline{x} is a vector whose cartesian coordinates are